JOURNAL OF THE ROYAL STATISTICAL SOCIETY (SERIES C)

Editorial Board

C. CHATFIELD
Joint Editor

V. BARNETT
Joint Editor

J. A. NELDER
Chairman

C. J. CLARK

B. E. COOPER

R. D. ELSTON

I. D. HILL

W. S. PAIGE

H. R. SIMPSON
Algorithm Editor

D. N. SPARKS
Review Editor

J. TAYLOR

G. WATTS

Applied Statistics

Volume 26, 1977

ROYAL STATISTICAL SOCIETY
25 Enford Street, London W1H 2BH

CONTENTS

Volume 26, 1977

No. 1

		Page
Computing maximum-likelihood estimates for the parameters of the de Wit competition model	*D. Machin and B. Sanderson*	1
A discrete alternative to the logistic growth function	*J. C. Nash*	9
A critical comparison of two methods of statistical discrimination	*J. Aitchison, J. D. F. Habbema and J. W. Kay*	15
An empirical study of the distribution of episodes of illness recorded in the 1970–71 National Morbidity Survey	*S. J. Kilpatrick, Jr*	26
An analytic variable selection technique for principal component regression	*E. R. Mansfield, J. T. Webster and R. F. Gunst*	34
Reliability of subjective probability forecasts of precipitation and temperature	*A. H. Murphy and R. L. Winkler*	41
Multivariate analysis of economic variables	*G. Gudmundsson*	48
The calculation of the posterior distribution of the cell means in a two-way unbalanced Manova	*D. B. Rubin and T. W. F. Stroud*	60

Miscellanea

On quick choice of power transformation	*D. Hinkley*	67
On the information matrix in the linear functional relationship problem	*W. M. Patefield*	69
The generation of gamma variables with non-integral shape parameters	*R. C. H. Cheng*	71
Approximations to the cumulative normal function and its inverse for use on a pocket calculator	*E. Page*	75
A report on the 1976 Cambridge Forecasting Conference	*O. D. Anderson*	76

Book Reviews

Assessment of Skeletal Maturity and Prediction of Adult Height. By *J. M. Tanner et al.*	80
Interpretation and Uses of Medical Statistics. By *G. J. Bourke and J. McGilvray*	81
Biomathematics: An Introduction. By *D. Machin*	81
Decision Methodology: A Formalization of the OR Process. By *D. J. White*	82
Geological Factor Analysis. By *K. G. Joreskog et al.*	82
Applied Econometrics. By *M. Desai*	83
Significance Tests. By *E. Caulcott*	84
Sequential Methods in Statistics. By *G. Barrie Wetherill*	85
The Mathematical Theory of Infectious Diseases and its Applications. By *N. T. J. Bailey*	85

*Statistical Algorithms AS*105–*AS*111 88

AS105 Fitting a covariance selection model to a matrix *Nanny Wermuth and E. Scheidt*; AS106 The distribution of non-negative quadratic forms in normal variables *J. Sheil and I. O'Muircheartaigh*; AS107 Operating characteristics and average sampling number for a general class of sequential sampling plans *B. Leventhal*; AS108 Multiple linear regression with minimum sum of absolute errors *S. C. Narula and J. F. Wellington*; ASR19 and AS109 A remark on AS63 and AS64 and a revised version of AS64 *G. W. Cran, K. J. Martin and G. E. Thomas*; AS110 L_p norm fit of a straight line *V. A. Sposito, W. J. Kennedy and J. E. Gentle*; ASIII The percentage points of the normal distribution *J. D. Bealsey and S. G. Springer*: ASR20 A remark on AS87 *J. E. Beardwood*; ASR21 A remark on AS16 *A. V. Swan*

Recent Statistical Algorithms 122

No. 2

Fluoridation of water supplies and cancer—a possible association? (A report commissioned by the Society's Council)	*P. D. Oldham and D. J. Newell*	125
The analysis of an unbalanced paired comparison experiment by multiple regression	*B. Johnston and C. Schwartz*	136
Comparison of the logistic and the Gompertz growth functions considering additive and multiplicative error terms	*S. Vieira and R. Hoffman*	143
A novel clustering method for estimating numbers of bird territories	*P. M. North*	149
Testing the normality of several independent samples using the Anderson–Darling statistic	*A. N. Pettitt*	156
Paired comparison product testing when individual preferences are stochastic: an alternative model	*G. Horsnell*	162
A class of transformations for Box–Jenkins seasonal models	*C. F. Ansley, W. A. Spivey and W. J. Wrobleski*	173
Estimation of interclass correlation from familial data	*B. Rosner, A. Donner and C. H. Hennekens*	179

CONTENTS

No. 2 (cont'd)

Page

Miscellanea

Some comments on multicollinearity in regression — *A. C. Harvey* — 188
The probability of being the lowest bidder — *M. S. Mitchell* — 191

Book Reviews

Time Series *and* Multivariate Analysis. Both by *Sir Maurice Kendall* — 195
Basic Ideas of Scientific Sampling. By *A. Stuart* — 195
Quantitative Methods for Business Decisions. By *L. L. Lapin* — 196
Forecasting for Business. By *D. Wood and R. Fildes* — 196
Probability Sampling of Hospitals and Patients. By *I. Hess et al.* — 196
Applications of Statistics to Industrial Experimentation. By *C. Daniel* — 197
Guide to Official Statistics. By *C.S.O.* — 198
Statisticaly Theory of Sample Survey Design and Analysis. By *H. S. Konijn* — 198

Statistical Algorithms AS112–AS115 — 199

AS112 Exact distributions derived from two-way tables *R. J. Baker*; AS113 A transfer algorithm for non-hierarchical classification *C. F. Banfield and L. C. Bassill*; AS114 Computing the numerator of ordinal measures of association when the data are ordered categories *B. L. Leathers*; AS115 Exact two-sided confidence limits for the odds ratio in a 2×2 table *Joyce Baptista and M. C. Pike*; ASR22 A remark on AS35 *I. D. Hill and R. Peto*

No. 3

Page

Proportional hazard regression models and the analysis of censored survival data — *R. Kay* — 227
A small circle of best fit for spherical data and areas of vulcanism — *K. V. Mardia and R. J. Gadsden* — 238
A cautionary note on selection of variables in discriminant analysis — *G. D. Murray* — 246
A general algorithm for analysis of variance — *R. W. Payne and G. N. Wilkinson* — 251
List sequential sampling with equal or unequal probabilities without replacement — *A. B. Sunter* — 261
Subjective probabilities and short-term economic forecasts: an empirical investigation — *F. M. O'Carroll* — 269
Tests for variance shift an at unknown time point — *D. A. Hsu* — 279
Dimensions of statistics — *D. J. Finney* — 285
On the order determination of ARIMA models — *T. Ozaki* — 290
An analysis of recidivism, using the truncated lognormal distribution — *Ann D. Witte and P. Schmidt* — 302
The form and estimation of a variance function with particular reference to radioimmunoassay — *D. J. Finney and Patricia Phillips* — 312
Selection of defining contrasts and confounded effects in two-level experiments — *M. F. Franklin and Rosemary A. Bailey* — 321
Simple Monte Carlo tests for spatial pattern — *J. Besag and P. J. Diggle* — 327

Miscellanea

The height and weight of Indian children — *K. R. Sundaram, I. M. S. Lamba and A. D. Taskar* — 334

Book Reviews

Statistics for Comparative Studies. By *M. Hills* — 336
Sampling Inspection in Statistical Quality Control. By *W. C. Guenther* — 337
Basic Statistics for Business and Economics. By *P. G. Hoel and R. J. Jessen* — 337
Fertility and Family Planning in Europe around 1970. By *U.N. Dept. of Economic and Social Affairs* — 338
An Introduction to Multivariate Techniques for Social and Behavioural Sciences. By *S. Bennett and D. Bowers* — 339
Computer Software for Social Science Data. By *B. Rowe and M. Scheer* — 340
Modelling and Control in the Biomedical Sciences. By *H. T. Banks* — 340
Multivariate Analysis in Behavioural Research. By *A. E. Maxwell* — 341
Statistics in Geography: a Practical Approach. By *D. Ebdon* — 341

*Statistical Algorithms AS*116–*AS*119 — 343

AS116 The tetrachoric correlation and its asymptotic standard error *M. B. Brown*; AS117 The Chirp discrete Fourier transform of general length *D. M. Monro and J. L. Branch*; AS118 Approximate rankits *B. Westcott*; AS119 Tabulating joint frequency distrituions *B. L. Leathers*; ASR23 A remark on AS61 *J. P. Ley*